

CLAIMS

What is claimed is:

- 1           1.       An integrated circuit comprising:
  - 2                   an amplifier formed on a semiconductor die, the amplifier having an
  - 3                   output port with an output impedance; and
  - 4                   a bondwire electrically connecting the output port to an external
  - 5                   conductor;
  - 6                   wherein the bondwire has a specified self-inductance and is operable to
  - 7                   match the output impedance to a desired load impedance.
- 1           2.       The integrated circuit of claim 1 wherein:
  - 2                   the amplifier is a radio frequency power amplifier.
- 1           3.       The integrated circuit of claim 1 wherein:
  - 2                   the semiconductor die is a metal-oxide semiconductor die.
- 1           4.       The integrated circuit of claim 1 wherein:
  - 2                   the semiconductor die is a gallium arsenide semiconductor die.
- 1           5.       The integrated circuit of claim 1 wherein:
  - 2                   the semiconductor die is a bipolar semiconductor die.
- 1           6.       A method for impedance matching comprising:

2 forming an amplifier on a semiconductor die, the amplifier having an  
3 output port with an output impedance; and  
4 connecting an electrically conducting bondwire between the output port  
5 and an external conductor;  
6 wherein:  
7 the bondwire has a specified self-inductance and is operable to  
8 match the output impedance to a desired load impedance.

1 7. The method of claim 6 wherein:  
2 the amplifier is a radio frequency power amplifier.

1 8. An integrated circuit comprising:  
2 an amplifier formed on a semiconductor die, the amplifier having an  
3 output port with an output impedance;  
4 a bondwire having a specified self-inductance and electrically connecting  
5 the output port to an external conductor; and  
6 a capacitor having a specified capacitance formed on the semiconductor  
7 die and electrically connected between the output port and a ground, wherein:  
8 the bondwire and the capacitor are operable to match the output  
9 impedance to a desired load impedance.

1 9. The integrated circuit of claim 8 wherein:  
2 the amplifier is a radio frequency power amplifier.

1 10. The integrated circuit of claim 8 wherein:

2 the bondwire, the capacitor and the desired load impedance are jointly  
3 operable to resonate at a normal operating frequency of the integrated circuit.

1 11. The integrated circuit of claim 8 wherein:

2 the semiconductor die is a metal-oxide semiconductor die.

1 12. The integrated circuit of claim 8 wherein:

2 the semiconductor die is a gallium arsenide semiconductor die.

1 13. The integrated circuit of claim 8 wherein:

2 the semiconductor die is a bipolar semiconductor die.

1 14. A method for impedance matching comprising:

2 forming an amplifier on a semiconductor die, the amplifier having an  
3 output port with an output impedance;

4 connecting an electrically conducting bondwire having a specified self-  
5 inductance between the output port and an external conductor;

6 forming a capacitor having a specified capacitance on the semiconductor  
7 die and electrically connected between the output port and a circuit ground,  
8 wherein:

9 the bondwire and the capacitor are jointly operable to match the output  
10 impedance to a desired load impedance.

1 15. An integrated circuit comprising:

2 an amplifier formed on a semiconductor die, the amplifier having an  
3 output port with an output impedance;

4 a first bondwire having a first specified self-inductance, and electrically  
5 connecting the output port to a first external conductor;

6 a second bondwire having a second specified self-inductance, and  
7 electrically connecting the first external conductor to a node on the die;

8 a first capacitor having a first capacitance formed on the semiconductor  
9 die and electrically connected between the node and a ground;

10 a second capacitor having a second capacitance embodied on the  
11 semiconductor die and electrically connected between the node and a third  
12 bondwire, the third bondwire having a third specified self-inductance and  
13 electrically connecting the second capacitor to a second external conductor

14 wherein:

15 the first, second and third bondwires and the first and second  
16 capacitors are operable to match the output impedance to a desired load  
17 impedance.

1 16. The integrated circuit of claim 15 wherein:  
2 the amplifier is a radio frequency power amplifier.

1 17. The integrated circuit of claim 15 wherein:  
2 the first capacitor is connected to ground via a further bondwire.

1 18. The integrated circuit of claim 15 wherein:  
2 the further bondwire connects to a thermal pad formed within the  
3 integrated circuit.

1           19.    An integrated circuit comprising:  
2                   a semiconductor die;  
3                   a first bondwire having a first self-inductance electrically connected to the  
4           die and to an external conductor;  
5                   a second bondwire having a second self-inductance electrically connected  
6           to the die and to the external conductor, wherein:  
7                   the first and second bondwires are operable to act as an inductor to form at  
8                   least a part of a circuit block comprised within the integrated circuit.

1           20.    The integrated circuit of claim 19 wherein:  
2                   the circuit block is an analog circuit.

1           21.    The integrated circuit of claim 19 wherein:  
2                   the circuit block is a radio frequency circuit.

1           22.    The integrated circuit of claim 19 wherein:  
2                   the circuit block is selected from a list consisting of:  
3                           an intra-stage match, an input stage match, a tuned circuit, an  
4                   oscillator, a filter, and a pre-selector for a radio receiver.

1           23.    The integrated circuit of claim 19 further comprising:  
2                   a further bondwire connected between the die and a ground.

1           24.    The integrated circuit of claim 19 further comprising:  
2                   a further bondwire connected between the die and a thermal pad.

1           25.    An integrated circuit comprising:  
2                   a semiconductor die;  
3                   a first bondwire electrically connected to the die and a periphery pad;  
4                   a second bondwire electrically connected to the die and the periphery pad,  
5        wherein:

6                   the first and second bondwires are operable to act as an  
7                   autotransformer to form at least a part of a circuit block comprised within  
8                   the integrated circuit.

1           26.    An integrated circuit comprising:  
2                   a semiconductor die;  
3                   a first bondwire electrically connected to the die and a first periphery pad;  
4                   a second bondwire electrically connected to the die and a second periphery  
5        pad, wherein:

6                   the first and second periphery pads are electrically connected, and

7                   the first and second bondwires are operable to act as an  
8                   autotransformer to form at least a part of a circuit block comprised within  
9                   the integrated circuit.

1           27.    An integrated circuit comprising:  
2                   a semiconductor die;  
3                   a first bondwire electrically connected to the die and a first periphery pad;  
4                   a second bondwire electrically connected to the die and a second periphery  
5        pad, wherein:

6 the first and second bondwires are operable to act as a transformer  
7 to form at least a part of a circuit block comprised within the integrated  
8 circuit.

1 28. A method for creating a passive component within an integrated circuit  
2 comprising:

3 connecting a bondwire between a semiconductor die and a periphery pad  
4 wherein the bondwire is operable to act as an inductor forming at least a part of a  
5 circuit block comprised within the integrated circuit.

1 29. The method of claim 28 further comprising:

2 connecting a further bondwire between the semiconductor die and the  
3 periphery pad.

1 30. A method for creating a passive component within an integrated circuit  
2 comprising:

3 connecting a first bondwire between a semiconductor die and a first  
4 periphery pad;

5 connecting a second bondwire between a semiconductor die and a second  
6 periphery pad electrically connected to the first periphery pad;

7 wherein the bondwires are jointly operable to act as an autotransformer  
8 forming at least a part of a circuit block comprised within the integrated circuit.

1 31. A method for creating a passive component within an integrated circuit  
2 comprising:

3 connecting a first bondwire between a semiconductor die and a first  
4 periphery pad;

- 5 connecting a second bondwire between a semiconductor die and a second  
6 periphery pad;  
7 wherein the bondwires are jointly operable to act as a transformer forming  
8 at least a part of a circuit block comprised within the integrated circuit

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